Report of the Committee on the Status of Women in Physics of the American Physical Society on the Site Visit to Argonne National Laboratory

on January 2–4, 2002

The visit on January 2-4, 2002 to review the status of Women in Physics at the Argonne National Laboratory (ANL) was the 27^{th} such site visit organized by the Committee on the Status of Women in Physics of the American Physical Society (CSWP/APS) and the second to a National Laboratory, the other visits having been to the National Center for Atmospheric Research (NCAR) and to Physics Departments in 25 universities throughout the US. The review team (Appendix A) consisted of 9 women physicists with expertise in physics research, research management, the DOE National Laboratory System, and the Site Visit Program of CSWP/APS. Interviews occurred between the review team members and female and male physics-related researchers, supervisors, laboratory administrators, and others (see site visit schedule - Appendix B).

The Laboratory Management was very welcoming to the visiting team, showed a sincere desire to elevate the status of women in Physics substantially and to make the site visit as productive and efficient as possible. The Argonne staff support that was provided to the visiting team was exemplary in every way.

The Laboratory leadership told us that they had been taking steps, especially in recent years, to increase the numbers and status of women in science and engineering at ANL, and that they felt encouraged by their progress in other fields, such as Mathematics & Computer Science, Chemistry, and Biology, but discouraged by their relative lack of progress in Physics. It was in this context that the Argonne Laboratory Management invited CSWP/APS to send a visiting team to assess the status of women in Physics at ANL and to provide insights into strategies for making progress in enhancing the status of women in Physics and in other science and engineering fields at ANL in general, and under conditions of flat funding and a declining laboratory employee census in particular.

The CSWP/APS Site visit team generally found male and female researchers at all levels to be enthusiastic about the research they were doing and about the opportunities for doing cutting-edge research provided by Argonne National Laboratory. This excitement about research was the reason why the researchers came to the laboratory in the first place and what motivated them from day to day.

On reviewing a CSWP-prepared questionnaire completed by 34 female and 111 male staff members (primarily physicists and coworkers in the divisions the team visited) and a large amount of data compiled and supplied by the Laboratory prior to and during our visit, the review team became aware of the small number of women in physics at Argonne. In the Divisions the team visited,[1] 5.7 percent of the scientists at grades 705-710 were female.[2] Women are

[1]Divisions: accelerator systems (ASD), experimental facilities (XFD), APS operations (AOD), and user programs (UPD) within the Advanced Photon Source; and materials science (MSD), high energy physics (HEP), physics (PHY), and neutron source (PNS) within Physical, Biological, and Computing Sciences

[2]Grades 705-710 are all permanent or potentially permanent positions, and thus exclude postdocs. For Ph.D.

unevenly distributed in those Divisions, however, ranging from 0 to 16 percent of the scientists in grades 705-710. Because the Divisions visited had 23-53 such scientists, a single woman could constitute as much as a 4.3 percent representation. No Division visited had more than 4 women in the 705-710 grades in FY00. Nationally, 9 percent of the physics population is female, and among recent Ph.D. recipients (the pool from which most Argonne hires are drawn) the representation is 13 percent. Some of the other DOE laboratories have higher representation of women among their physicists, e.g., at SLAC 17 percent of the staff classified as physicists are female. Especially striking at Argonne is the lack of women among the senior scientific staff (grades 708-710). Only two of the eight Divisions we visited had even one such woman (and none had more than one), although a total of 96 men held positions of grade 708-710 in FY00. This paucity of representation was noted by ANL management in its discussions with the review team. The questionnaire also clearly documented a large discrepancy in perception between female and male physicists at similar levels in their careers about their own status at ANL, and this discrepancy was supported by the majority of the actual interviews. Connected to this difference in perceptions was evidence for a communication gap between the female physicists and their group leaders/division heads, who in many cases seriously overestimated the job satisfaction level of the female physicists under their watch, when the group leaders described these women individually and also when the women were described in relation to their male counterparts.

For most of the young women that were interviewed by the visiting team members, there seemed to be a need for more mentoring and interaction on their scientific research. Overall the scientific mentoring of young people at ANL seemed to be uneven. Some women and men were very pleased, but many, perhaps most, of both groups were not. Specifically, on average, women were less pleased than men. This was particularly true for women above the postdoc level, who often felt that although their needs for mentoring diminished as they became more experienced, the amount of such guidance provided at ANL dropped off even more sharply. The postdocs and those with term appointments often were not aware who had responsibility for providing them with guidance in their scientific development. Similarly, most young women felt a need for more guidance in their career development from their research supervisors and group leaders. By contrast, many of the managers we spoke with felt that such mentoring "happens naturally", and that it was indeed taking place to the degree necessary. Many managers expressed the feeling that it was not their responsibility to assure that such guidance is offered to young scientists, but rather that the junior staff should assess their own needs and identify and seek out appropriate mentors on their own. Women physicists often complained of isolation and said that they had little opportunity to network with peers, to learn better how to get ahead at ANL or in their careers. Quite a few women said they didn't have much contact with other women at ANL, unless they worked in a similar technical area and happened to run into these women for that reason. Other contacts, even between women in the same division, were often made entirely accidentally, for example at the child care center.

We learned on our site visit that Argonne National Laboratory has had an active Women in Science and Technology (WIST) program since 1990. This program coordinates regularly scheduled, informal meetings that provide laboratory-wide wide-ranging information exchange, as well as important and powerful networking opportunities. Argonne has also had a very

scientists, the typical entry grade beyond the postdoc is 705 (Assistant Scientist), an "up or out" level analogous to Assistant Professor in an academic setting. Grade 710 is held only by a few of the most distinguished scientists in the laboratory (none of whom are female).

good program of outreach to K–12 students to increase their interest in science and technology, and WIST has provided ideas, coordination, and volunteers for several exemplary activities targeting girls. Regular attendees of WIST activities appeared very pleased with WIST accomplishments over the years, especially with regard to networking among attendees and with the outreach activities to young girls (K–12) with interests in science and technology. However, the young women postdocs and staff members we interviewed did not seem to be much involved with WIST activities, or didn't know much about WIST. The supervisors of these young women were also often ill-informed about WIST, and thus were unable to point the women toward these opportunities for networking. In other cases, the supervisors considered such activities a waste of valuable working time, and actively discouraged young women from attending.

When WIST was established, Argonne National Laboratory also created the position of Women's Program Initiator (WPI), who serves for a two-year term and has support provided by the ANL Director's Office, to initiate, coordinate, and champion women's programs at ANL. To set priorities for the Woman's Program Initiator, there is a 12-member WIST Steering Committee with broad Laboratory representation. This advisory structure has been helpful in building relationships between women staff members and senior management, and it has been effective in the outreach program. On the other hand, neither the WIST structure nor the Women's Program Initiator structure has had a clear impact on increasing the number of women in physics and on enhancing the status of women physicists at ANL. Team members got the impression that when the program was set up in 1990, and in subsequent years, ANL management had hoped that it would have a significant positive effect on the opportunities for technical women to come to ANL and flourish there. The CSWP/APS visiting team found that these hopes had not materialized, and recommends that a more proactive management approach is needed to achieve this goal. The CSWP/APS visiting team took away a negative message from having the WPI's programmatic supervisor serve on the Advisory Committee to oversee her WPI activities.

From our interviews, it appears that the dominant entry point for women physicists into a permanent position at ANL is through a postdoctoral appointment, followed by possible promotion to a 5-year term position as an Assistant Scientist, and then by a possible promotion to a permanent position as a Scientist. The interviews indicated that the selection of postdocs is done by the supervisor on an availability basis of a narrowly qualified candidate pool with little active recruitment or advertising taking place. Even for the hiring of more senior staff, there did not seem to be a systematic recruitment procedure that reached out broadly and to diverse applicants. A more systematic approach at the division level, if not laboratory-wide, would make it easier to take advantage of the fact that women are better represented among recent Ph.D.s than among older scientists, and thus to recruit a higher percentage of women into the entry-level postdoc positions. It would also make it more likely that the most suitable candidates, regardless of gender, are identified and recruited. Care in this effort, including formal lab-wide recommended procedures for mentoring and career guidance of the young scientists, would help assure the future strength of the ANL scientific staff and lead to greater job satisfaction for both women and men, as well as help to foster loyalty toward ANL from the early career scientists, some of whom naturally move on to other laboratories.

Nearly everyone who was interviewed by our visiting team seemed unclear about the guidelines, criteria and methodology for the annual performance review and for promotion to the

next level. The women we interviewed were even more unclear about these issues than were the men we interviewed. Furthermore, there did not seem to be a clear path for researchers interested in entering the management track to follow, nor did the management appear to have any established mechanism for identifying and mentoring promising candidates for managerial roles. There were also questions about the best track to follow to become an independent research leader and research initiator. Many expressed discontent with having the same people in the same management positions for many years, thereby closing advancement opportunities for some of the ambitious and active young people. It was pointed out that group leaders had great power over employees in their groups, and that the long tenure of certain managers in the same positions (beyond 6–10 years) often led to biased evaluations of people in the research group, and these long management tenures were not generally good for morale nor for the stability of a robust management system. We received no clear picture of how upper levels of management evaluated the managerial performance of lower-level managers. The staff members we spoke to also did not perceive that their immediate managers were held responsible for assisting the development of those whom they supervise. This was cited both as a management issue and as a morale issue. The lack of appropriate management training for managers was felt both by the people we interviewed and by the visiting team members to be a significant weakness of the management system at ANL, and this issue did not seem to be appreciated by many of the managers who were interviewed. The interviews revealed that there were perceptions of unfairness in salary increases, promotions, and access to resources, but it was difficult for the visiting team to evaluate these perceptions in light of the unclear guidelines in many of the personnel practices, and the lack of clear information regarding salaries and job classifications.

Several women who were interviewed expressed a concern about the low level of participation of women on important decision-making committees at ANL, and the interviewees also pointed out the importance of such participation in improving the overall governance of the Laboratory generally (since under-represented groups often have different ways to view certain important governance issues), in addition to improving the status of women at the Laboratory. As a result of the present status of women in physics at the lab, the visiting team found that the number of role models and women in leadership positions is inadequate to meet the laboratory's needs, and increasing the number of such women could help improve the status of women more quickly than is possible now. A number of women brought up a feeling of marginalization, which is typical of environments where women are few in number, and are not in positions of influence. Many of the women we interviewed raised the problem of the retention of women in physics, citing the difficult environment experienced by women at ANL to be a major reason for wanting to leave the Laboratory, and the written responses to the questionnaire also supported the finding of differences between men and women relative to retention and promotion. There was a common perception among women, becoming more pronounced as the seniority increased, that their capabilities were not well utilized at ANL, on an absolute scale, nor relative to men at the same length of service at ANL. Although some of the managers the team interviewed felt that they had been paying attention to the "two-body problem," several women who were interviewed did not share this view.

Stemming from the findings of this visiting team, several recommendations for change follow that would improve the status of women in physics at Argonne National Laboratory (and would probably also be beneficial for many other laboratory employees as well).

1. The top management at ANL should commit itself to clarify, communicate, and improve personnel practices in a number of areas, including recruitment, promotions, annual per-

sonnel reviews, salary increases, resource allocation, mentoring, career development, ombudsperson methodology, and representation on important laboratory policy committees. These improvements should be directed especially, but not exclusively, at staff members at early stages of their careers. This includes post-doctoral as well as potentially permanent and permanent employees. An ombuds program as a channel for employees to seek guidance and address grievances should be established and supported. More transparent and effective methods for handling these personnel practices need to be developed, and accountability for their implementation must be assigned. For example, managers should be held explicitly responsible for "bringing along" people under their watch and this responsibility should be part of their annual evaluation.

2. Top management at ANL should take steps (interventions), using financial and other incentives to increase the number of women in physics at Argonne National Laboratory to mirror national averages and the best practices at DOE labs. In addition, management should make serious, sustained, and credible efforts to hire or promote women into more senior positions (broadly speaking) and into positions of authority. In order to retain these women, action must be taken to improve their working environment and advancement opportunities to be equal to those resulting from the best practices within the DOE national laboratory system. Judging from similar efforts at other institutions, the cost of implementation of such changes is small, and the returns in staff productivity are large.

3. Upper management should make a more realistic assessment of how the role of the Women's Program Initiator (WPI) fits into a broader strategy for increasing the number of women scientists and engineers at ANL, improving the work environment they encounter, and in enhancing their opportunities for advancement through the system. The visiting team feels that more high-level management involvement is needed to achieve the goals expressed by management to the visiting team. The visiting team feels that the hope that WIST and the WPI could "solve the problem" has not been fulfilled.

4. The CSWP/APS visiting team recommends that WIST attempt a proactive approach toward mentoring and networking with women postdocs and those in entry-level positions. To be effective, such activities should involve personal contact (perhaps by telephone), not merely e-mail, paper announcements, and seminar lists.

5. Mandatory training of supervisors should be instituted to educate them about management techniques and responsibilities, and about personnel practices and policies at ANL.